

### **ABSTRACT OF THE DISCLOSURE**

The present invention provides a meshing method, called grafting, that lifts the prior art constraint on abutting surfaces, be they linking, source/target, or other types of surfaces of the trunk volume. The grafting method locally modifies the structured mesh of the linking surfaces  
5 allowing the mesh to conform to additional surface features. The grafting method may also locally modify a non-structured mesh of the abutting surfaces. Thus, the grafting method can provide a transition between multiple sweep directions extending sweeping algorithms to  $2\frac{3}{4}$ -D solids. The method is also suitable for use with non-sweepable volumes; the method provides a transition between meshes generated by methods other than sweeping as well.